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(71) Applicant(s)
James & Harris Limited
(Incorporated in the United Kingdom)
33 Meadow Close, Hockley Heath, SOLIHULL, B94 6PF, United Kingdom

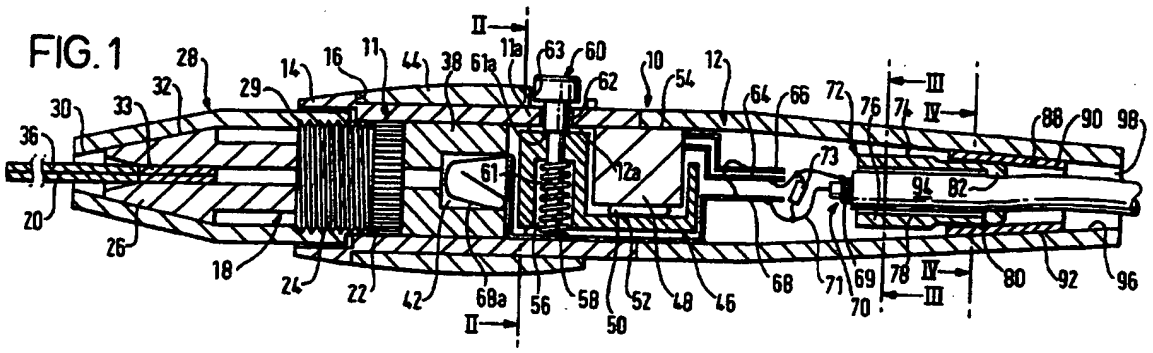
(72) Inventor(s)
Brian James Sheppard
Michael Jones

(74) Agent and/or Address for Service
Withers & Rogers
4 Dyer's Buildings, Holborn, LONDON, EC1N 2JT, United Kingdom

(54) Abstract Title
A holder for a treatment probe having a biased switch

(57) The holder 10 has thereon a switch 48 arranged, in use, across first and second electrical conductors 64,66 one of which comprises a conductor for supplying an electrical signal to the probe 20, the switch 48 being normally biased into a first operating condition until an operating member 60 for the switch 48 is manipulated by a user of the holder 10 to bring the switch 48 into a second operation condition.

FIG. 1



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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1995

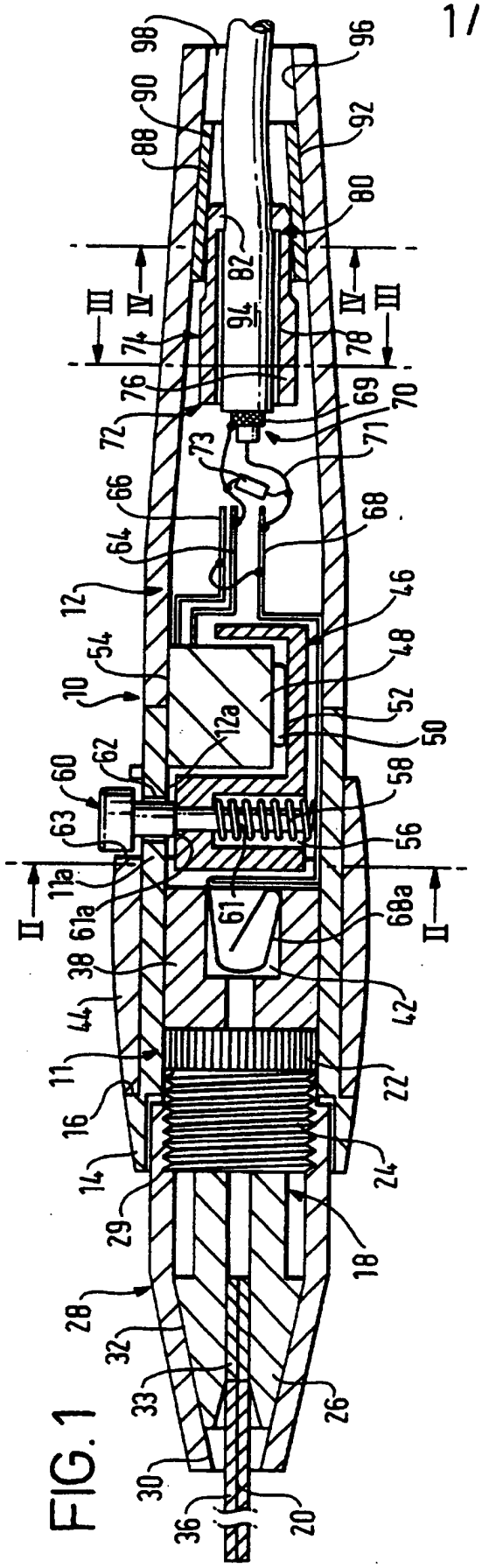

FIG. 1

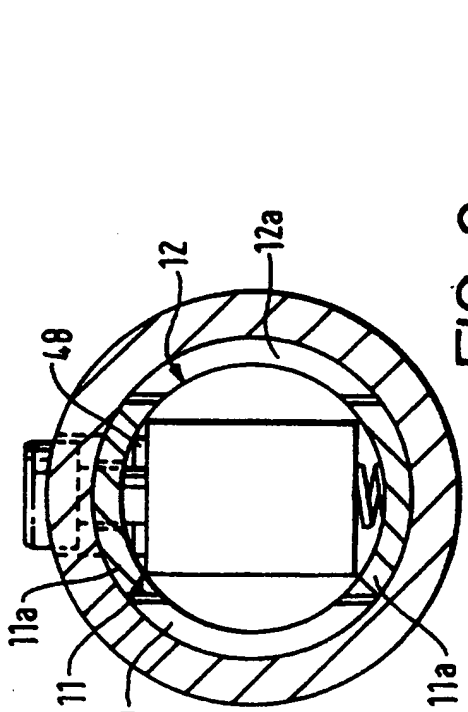

FIG. 2

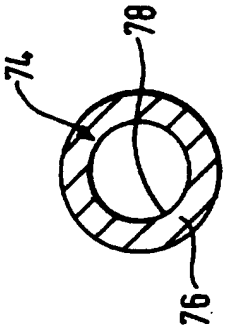

FIG. 3

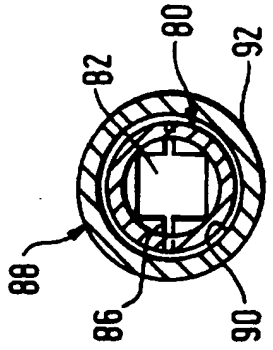

FIG. 4

A HOLDER FOR A TREATMENT PROBE

The invention relates to a holder for a treatment probe and is particularly, but not exclusively, concerned with a holder for a treatment probe for use in the removal of unwanted hair by electrolysis.

When treatment of a patient requires the application of an electrical signal by a probe applied to a given surface area of skin or by insertion into the skin, it is highly desirable that there is no current or voltage applied to the probe until the probe has been placed fully in position. If an electrical signal is present at the time that the probe is applied, the sensation felt by the patient causes discomfort.

Where the probe is in the form of, say, a needle for insertion into the skin of the patient, it is essential to ensure accurate placement of the needle into the skin and to maintain stability of movement of the needle. A suitable holder is provided for probes such as electrolysis needles which needs to be light in weight not only for easy hand-holding but for stability and flexibility of movement.

To ensure that an electrical signal is applied to the probe only after it has

been placed properly in position on the patient a suitable switch is needed for switching on the signal after placement of the probe.

Normally, high frequencies need to be applied to the treatment probe particularly when the probe takes the form of a needle for hair removal. In order to accommodate such high frequencies, an in-line switch of substantial capacity is required which is impossible to house in the probe mounting (the ideal position). The fitting of a small switch in the supply line within the probe mounting which will be sufficiently light in weight and acceptable to the operator, would be ideal. However such a switch would not provide the required attenuation characteristics nor meet the electrical supply specification for the high frequencies often used. Therefore, the patient would feel an unpleasant sensation as the probe were applied and before the switch were operated to begin the treatment.

It is possible to provide a foot-operated remote switching arrangement. However, such an arrangement requires hand and foot co-ordination which can lead to patient discomfort.

In our co-pending patent application number ..... entitled a Treatment Probe Power Circuit filed simultaneously herewith, a Treatment Probe

Power Circuit is described which enables a switch of a lightweight nature to be used in a holder for the treatment probe. The present invention is concerned with an improved holder for housing a switch used in such a power circuit.

According to the invention there is provided a holder for a treatment probe, the holder having thereon a switch arranged, in use, across first and second electrical conductors one of which comprises a conductor for supplying an electrical signal to the probe, the switch being normally biased into a first operating condition until an operating member for the switch is manipulated by a user of the holder to bring the switch into a second operation condition.

The switch may have contacts which are normally held closed in the first operating condition until opened by manipulation of the operating member to bring the switch into its second operating condition. In such a case, the switch may have normally open contacts which are held closed by spring means on the holder, manipulation of the operating member by the user being arranged to overcome the bias of the spring means to cause the switch contacts to open.

Preferably, the switch is mounted on a carrier in the mounting which is movable by the operating member relative to the mounting. In such a case, the switch may be mounted on a carrier between a surface of the carrier and an opposing surface of the mounting.

In a preferred embodiment, the switch is mounted on a carrier in the mounting between a surface of the carrier and an opposing surface of the mounting, the switch having an actuating element thereon which is biased by means on the switch towards a position where the switch would normally be in said second operating condition, spring means being provided which urges one of said surfaces towards the other to hold the actuating element against said bias to hold the switch in said first operating condition, manipulation of the operating member being arranged to move the carrier against said spring such that the said surface of the carrier moves away from the said opposing surface of the mounting to enable the actuating member to move and bring the switch into its second operating position.

The holder may include a mounting for the probe, the mounting being operable to grip or release the probe by means of a sleeve which fastens to a section of the holder. In such a case, the holder preferably has a

tubular extension thereon which receives a portion of the sleeve and which overlies said section of the holder. The said section may be part of the mounting for the probe. The aforesaid sleeve may extend axially beyond a distal end of the mounting for the probe when the holder is held in place on the mounting by the sleeve.

The holder may include a grip device for a power supply cable. The grip device is arranged to hold the cable firmly within the holder so if a tensile force is applied to the cable externally of the holder, the grip will prevent conductors of the cable becoming detached from, say, the switch in the holder. The grip may comprise a tubular gripping member comprising, for example, a first portion having a first internal cross-section and a second portion having a second internal cross-section arranged to clamp the cable.

The first internal cross-section may be circular and the second internal cross-section may be rectangular.

The second section preferably comprises movable gripping surfaces. The movable gripping surfaces are preferably clamped on to the cable by a clamping member which may be tapered to effect a wedge action to

clamp the cable. The clamping member may itself wedge into a portion of the holder to resist tensile force applied to the cable externally of the holder.

The holder is preferably elongate and, in such a case, the probe may be arranged at one end of the holder and the grip adjacent the other end of the holder.

A holder for a treatment probe in accordance with the invention will now be described by way of example with reference to the accompanying drawings in which:

Fig 1 is a longitudinal cross-section through a treatment probe holder in accordance with the invention;

Fig 2 is a cross-section through the treatment probe holder of Fig 1 on the line II - II in Fig 1,

Fig 3 is a cross-section through a cable grip in the holder of Fig 1 on the line III-III in Fig 1 and

Fig 4 is a further cross-section through the cable grip on the line IV-IV in Fig 1.

With reference to Fig 1, the holder 10 has a cylindrical body comprising front and rear sections 11, 12 respectively. Each of the front and rear sections 11, 12 has two diametrically opposed fingers 11a, 12a respectively as shown in Fig 2 which extend axially. The fingers 11a intercalate with the fingers 12a when the front and rear sections 11, 12 are assembled as in Fig 1. The front section 11 has a tubular extension 14 at its front end which defines a rearwardly facing annular shoulder 16. The front end of the body section 11 has press-fitted therein a mounting 18 for a treatment probe 20 such as an electrolysis needle for use in removal of hair. The mounting 18 is formed from metal and comprises a splined press-fit section 22, a screw-threaded section 24 and resilient collet-like jaws 26 which project forwardly from the screw-threaded section 24. A tapered sleeve 28 has its wider end formed with screw threads 29 which enable the sleeve 28 to be screwed on to the screw threaded section 24 of the mounting 18. The first end of the sleeve 28 extends axially beyond the distal ends of the jaws 26. By screwing the sleeve 28 on to the screw threaded section 24, a tapering internal surface 30 on the sleeve 28 contacts tapering external surfaces 32 on the jaws 26 and causes the jaws

26 to be moved towards each other thereby effecting a grip on a ferrule 33 in which the needle 20 is mounted.

As will be appreciated from Fig 1, the tubular extension 14 extends over the screw threaded end of the sleeve 28. The extension 14 prevents a user from touching the screw threaded section 24 of the mounting 18 when the sleeve 28 is partially unscrewed to enable the probe 20 to be removed from the jaws 26. Normally, when removing and inserting the probe 20, an insulative tubular cover 36 is placed around the probe which is removed once the probe has been placed in position. The cover 36 prevents accidental contact with the probe 20 as it is being inserted in or removed from the jaws 26. If the screw threaded section 24 were exposed during such insertion or removal, there could be a risk of the user of the holder 10 touching the screw threaded section 24 and receiving a pulse of electrical power should the power be accidentally switched on with the sleeve 28 partially unscrewed. The presence of the tubular extension 14 prevents that.

As mentioned above, the front end of the sleeve 28 extends axially beyond the distal ends of jaws 26. Where the jaws 26 are not carrying the probe 20, the overhanging front end of the sleeve 28 minimises the risk

of finger contact with the ends of jaws 26 which could otherwise result in the user receiving an electrical pulse should the power be accidentally switched on.

The press fit section 22 is integral with or connected to a rearwardly extending metal cylindrical part 38 formed with a counterbore 42. The cylindrical part 38 is a close fit within the body 12.

An annular hand grip section 44 fits around the fingers 11a, 12a in contact with the annular shoulder 16 and is suitably secured in position.

The body section 12 houses a carrier 46 for a microswitch 48.

The switch 48 has an actuating member 50 and the switch is of a type where the actuating member 50 is normally biased outwardly by a spring inside the switch. In its outward position, the actuating member 50 allows contacts (not shown) within the switch 48 to close. The switch 48 is arranged between a surface 52 on the carrier 46 and a surface 54 on the body section 12. The carrier 46 is formed with a recess 56 which houses a spring 58 arranged normally to urge the carrier 46 towards the surface 54 thereby depressing the actuating member 50 and holding the switch contacts open. The carrier 46 has therein an operating button 60 which

projects through radial openings 62, 63 formed respectively in the upper finger 11a of the body section 11 and the hand grip 44 for manipulation by a user. When the user applies manual pressure to the operating button 60, the operating button 60 moves the carrier 46 downwardly against the spring 58 thereby allowing the actuating member 50 to move outwardly from the body of the switch 48 to close the contacts in the switch. The operating button has an elongate shank 61 extending from a shoulder 61a and through the spring 58.

The switch 48 has leads 64, 66 and it will be noted that the lead 66 is electrically connected to a metal strip conductor 68 by means of which electrical power is connected to the probe mounting 18. The conductor 68 terminates at a resilient end section 68a which wedges into the counter bore 42 and is thereby electrically connected to the mounting 18. The switch lead 64 is connected to a switching circuit for controlling the flow of power to the conductor 68 and in that respect, reference is made to our aforesaid co-pending patent application which is incorporated herein by reference.

The switch lead 64 is connected to an outer braid 69 of a coaxial cable 70 and the conductor 68 is connected to the central core 71 of the cable 70.

A terminating network, in this case a resistor 73, is connected in parallel across the braid 69 and the central core 71 as also described in our aforesaid co-pending application. The resistor 73 may be arranged in a suitably supported holder (not shown) in body section 12. Instead of comprising a resistor 73, the terminating network could include other components, e.g. a combination of resistance capacitance and inductance.

The cable 70 passes rearwardly through a cable grip indicated generally at 72. The cable grip 72 comprises a tubular gripping member 74 having a first portion 76 defining a cylindrical section 78 and a second portion 80 defining a rectangular cross-section 82. The second portion 80 is split axially as indicated at 86 in Fig 4. The cable grip 72 includes a clamping member 88 which has tapering internal and external surfaces 90, 92 respectively. The coaxial cable 70 has an outer sheath 94 which passes freely through the cylindrical internal section 78 but which tends to splay apart the split second portion 80. The clamping member 88 passes over the second portion 80 so that the tapered internal surface 90 acts in a wedge-like manner against the second portion 80 so that the surfaces of the rectangular cross-section 82 move into clamping contact with the outer sheath 94 of cable 70. The cable grip 72 is arranged at the rear of the body 10 so that the tapered external surface 92 of the clamping

member 88 fits snugly into a tapered section 96 of the rear body section 12. The tapered section 96 has an opening 98 therein through which the coaxial cable 70 passes. Tension applied to the cable 70 externally of the body 10 will tend to wedge the clamping member 88 against the tapered section 92 which, in turn, will tend to increase the clamping load on the cable 70.

In order to switch on power to the conductor 68 as described in the co-pending application mentioned above, the user depresses the operating button 60 thereby opening the contacts of switch 48 to cause current to flow to the probe 20.

Subsequent release of such manual pressure will enable the spring 58 to urge the carrier 46 towards the surface 54 such that the actuating member 50 closes the contacts of switch 48 once again.

Instead of using a normally open switch 48 which is held closed by means of the spring 58, it is envisaged that the switch 48 may be replaced by a normally closed type which can be operated by the user and which is connected across the conductors 66, 68 in the holder 10.

If desired an indicator such as a neon or LED component can be incorporated in the holder, for example, that the switch 48 has been operated.

A holder in accordance with the invention is particularly advantageous as a very light weight and small switch 48 can be used within the holder 10 making the holder particularly easy to control for optimum stability and flexibility of movement.

Claims

1 A treatment probe holder, the holder having thereon a switch arranged, in use, across first and second electrical conductors one of which comprises a conductor for supplying an electrical signal to the probe, the switch being normally biased into a first operating condition until an operating member for the switch is manipulated by a user of the holder to bring the switch into a second operating condition.

2 A treatment probe holder according to claim 1 in which the switch has contacts which are normally held closed in the first operating condition until opened by manipulation of the operating member to bring the switch into its second operating condition.

3 A treatment probe holder according to claim 2 in which the switch has normally open contacts which are held closed by spring means on the holder, manipulation of the operating member by the user being arranged to overcome the bias of the spring means to cause the switch contacts to open.

4 A treatment probe holder according to any preceding claim in which the switch is mounted on a

carrier in the mounting which is movable by the operating member relative to the mounting.

5 A treatment probe holder according to claim 4 in which the switch is mounted on a carrier between a surface of the carrier and an opposing surface of the mounting.

6 A treatment probe holder according to any preceding claim in which the switch is mounted on a carrier in the mounting between a surface of the carrier and an opposing surface of the mounting, the switch having an actuating element thereon which is biased by means on the switch towards a position where the switch would normally be in said second operating condition, spring means being provided which urges one of said surfaces towards the other to hold the actuating element against said bias to hold the switch in said first operating condition, manipulation of the operating member being arranged to move the carrier against said spring such that the said surface of the carrier moves away from the said opposing surface of the mounting to enable the actuating member to move and bring the switch into its second operating position.

7 A treatment probe holder according to any preceding claim in which the holder includes a mounting for the probe, the mounting being operable to grip or release the probe by means of a sleeve which fastens to a section of the holder.

8 A treatment probe holder according to claim 7 in which the holder has a tubular extension thereon which receives a portion of the sleeve and which overlies said section of the holder.

9 A treatment probe holder according to claim 8 in which the said section is part of the mounting for the probe.

10 A treatment holder according to claim 7 or 8 in which the sleeve extends axially beyond a distal end of the mounting for the probe when the holder is held in place on the mounting by the sleeve.

11 A treatment probe holder according to any preceding claim in which the holder includes a grip device for a power supply cable.

12 A treatment probe holder according to claim 11 in which the grip device comprises a tubular gripping

member.

13 A treatment probe holder according to claim 12 in which the tubular gripping member comprises a first portion having a first internal cross-section and a second portion having a second internal cross-section arranged to clamp the cable.

14 A treatment probe holder according to claim 13 in which the first internal cross section is circular.

15 A treatment probe holder according to claim 13 or 14 in which the second internal cross section is rectangular.

16 A treatment probe holder according to any of claims 13 to 15 in which the second portion comprises movable gripping surfaces.

17 A treatment probe holder according to claim 16 in which the movable gripping surfaces are clamped on to the cable by a clamping member.

18 A treatment probe holder according to claim 17 in which the clamping member is tapered to effect a wedge action to clamp the cable.

19 A treatment probe holder according to claim 17 or 18 in which the clamping member wedges into a portion of the holder to resist tensile force applied to the cable externally of the holder.

20 A treatment probe holder according to any preceding claim in which the holder is elongate.

21 A treatment probe holder according to any of claims 11 to 19 in which the holder is elongate and in which the probe is arranged, in use, at one end of the holder and the grip is arranged adjacent the other end of the holder.

22 A treatment probe holder constructed and arranged substantially as described herein with reference to the accompanying drawings.

23 A holder for a treatment probe, the holder having thereon switch arranged, in use, across first and second electrical conductors one of which comprises a conductor for supplying an electrical signal to the probe, the switch being normally biased into a first operating condition until an operating member for the switch is manipulated by a user of the holder to bring

the switch into a second operating condition.

24 A holder for a treatment probe according to claim 23, the holder having the features of the holder according to any of claims 2 to 22.

The Patent Office

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Application No:	GB 9712827.6	**Examiner:**	Eamonn Quirk
Claims searched:	1-24	**Date of search:**	3 September 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): A5R(RHCC, RHCE)

Int Cl (Ed.6): A61B (17/36, 17/38,17/39, 17/41)

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2 280 610 A	(Conmed Corporation) Page 9 lines 9-15	1-3, 23 at least
X	US 5 133 712	(Selvac Corporation) Whole Document	1-3, 23 at least
X	WO 81/00200 A1	(Janet Esty) Figure 9, resilient washer 120 and pushbutton 22	1-3,23 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.